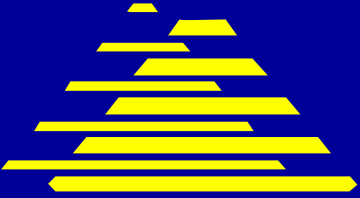


PSP, TSP, XP, CMMI... eating the alphabet soup!

Daniel M. Roy
SSTC 2011
19 May 2011

PSP, TSP, Personal Software Process and Team Software Process are service marks of CMU
CMM and Capability Maturity Model are registered in the U.S. patent and trademark office

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a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



Agenda

Robust, fragile, agile

From CMMI to TSP

The manifesto

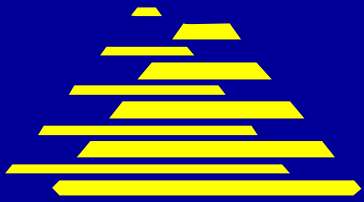
XP and SCRUM vs. CMMI

PSP and TSP at work

Earned value for the rest of us

Synergy


Surf the next wave!



Different tacks

3





Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others do it.
Through this work we have come to value:

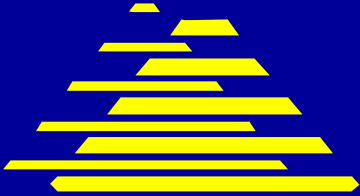
Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

Kent Beck
Mike Beedle
Arie van Bennekum
Alistair Cockburn
Ward Cunningham
Martin Fowler

James Grenning
Jim Highsmith
Andrew Hunt
Ron Jeffries
Jon Kern
Brian Marick

Robert C. Martin
Steve Mellor
Ken Schwaber
Jeff Sutherland
Dave Thomas



XP 12 KPs

The Planning Game

Small Releases

Metaphor

Simple Design

Incremental testing

Refactoring

Pair Programming

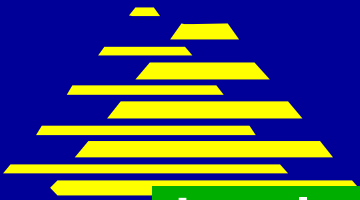
Collective Ownership

Coding Standards

40-hour Week

On-site Customer

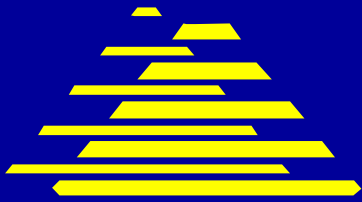
Continuous integration



Scrum and CMMI V1.3

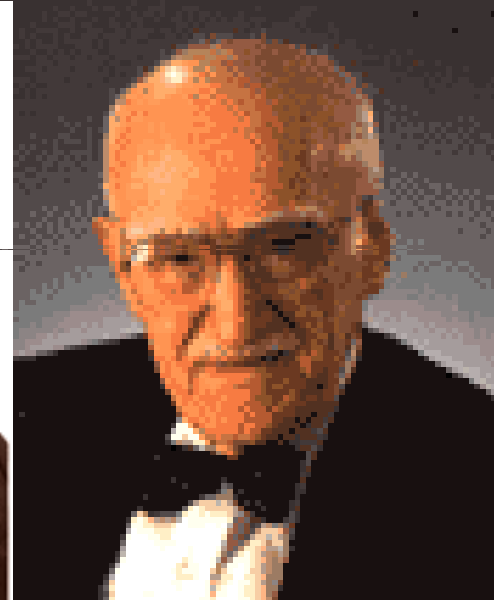
6

Level	Focus	Process Areas
5 Optimizing	Continuous process improvement	Organizational Performance Management Causal Analysis and Resolution
4 Quantitat. Managed	Quantitative management	Organizational Process Performance Quantitative Project Management
3 Defined	Organization engineering process standardization	Requirements Development Technical Solution Verification Validation Organization Process Focus Organization Process Definition Organizational Training Integrated Project Management Risk management Decision Analysis and Resolution Product Integration
2 Managed	Basic Project management	Requirements management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management

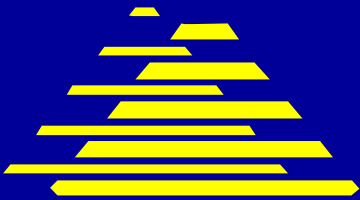


From CMMI to TSP

The CMMI

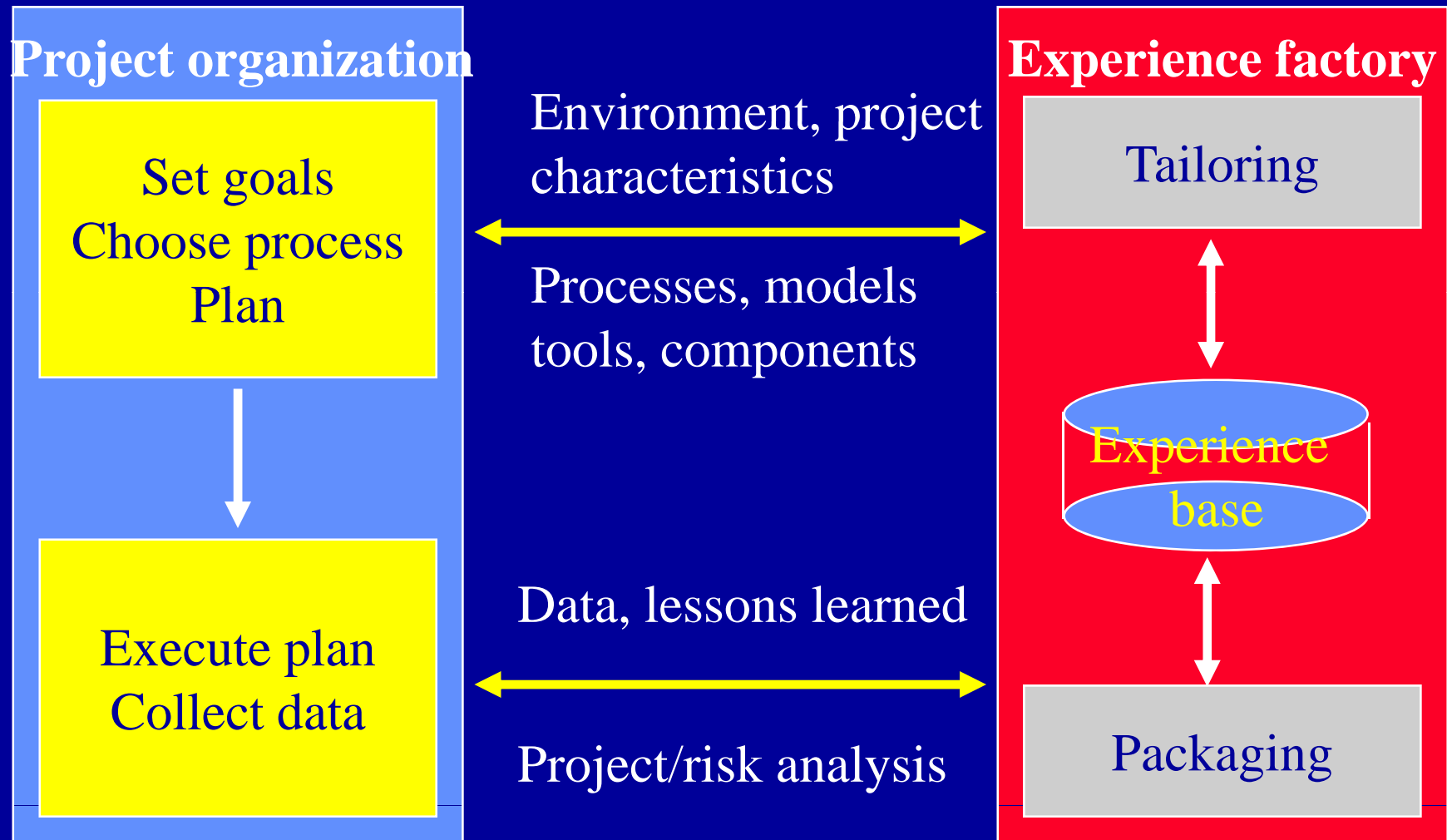


- demonstrates development practices and improvement techniques at the individual and small team level
- provides a framework for data-driven improvement

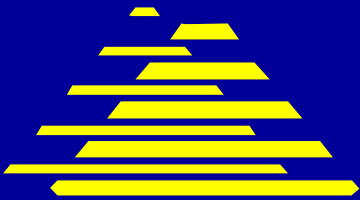


The experience factory

8



From 'The experimental paradigm in software eng.',
Rombach, Basili, Selby, Springer-Verlag, 1994



What's a PSP?

9

The PSP is a self improvement paradigm based on individual procedures and **data**

A small set of scripts, standards and forms

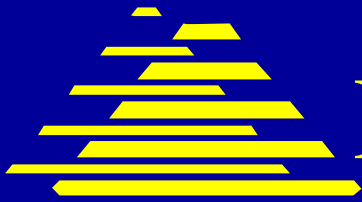
A simple but highly effective measurement framework

Self management based on **individual metrics**

Fostering commitment to quality principles

It is an agile **level 5 process for individuals**

It is also a one person implementation of Basili's
Quality Improvement Paradigm (experience factory)

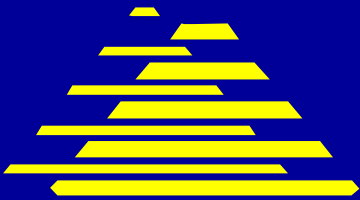


From a great founding father

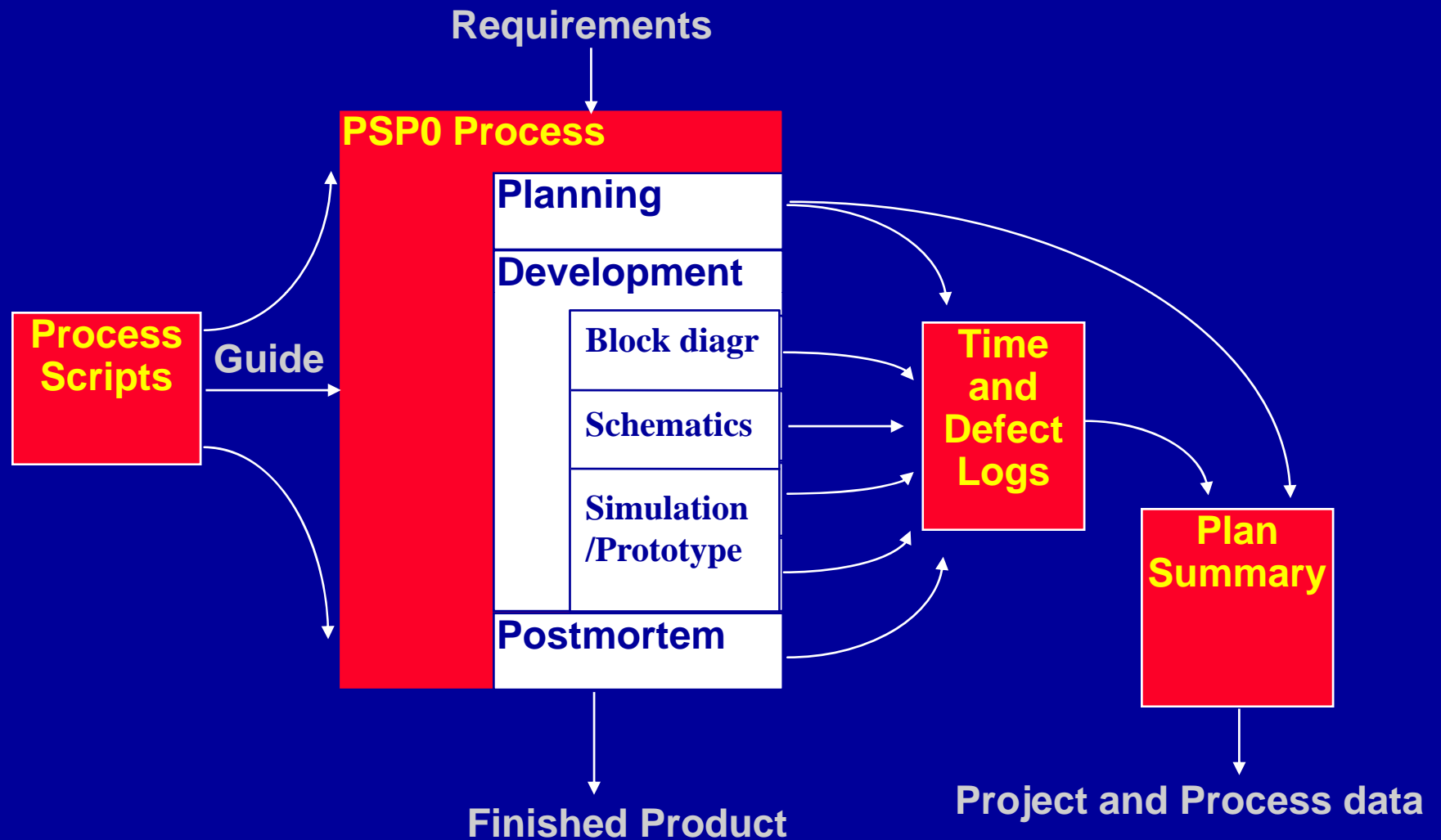
“At the Software Engineering Lab (NASA GSFC) we have applied evolutionary improvement concepts (PDSA) to the development domain...

With this [PSP] book, Watts Humphrey has developed an evolutionary improvement paradigm at the personal level by providing a mechanism for learning through experience, measurement and feedback.”

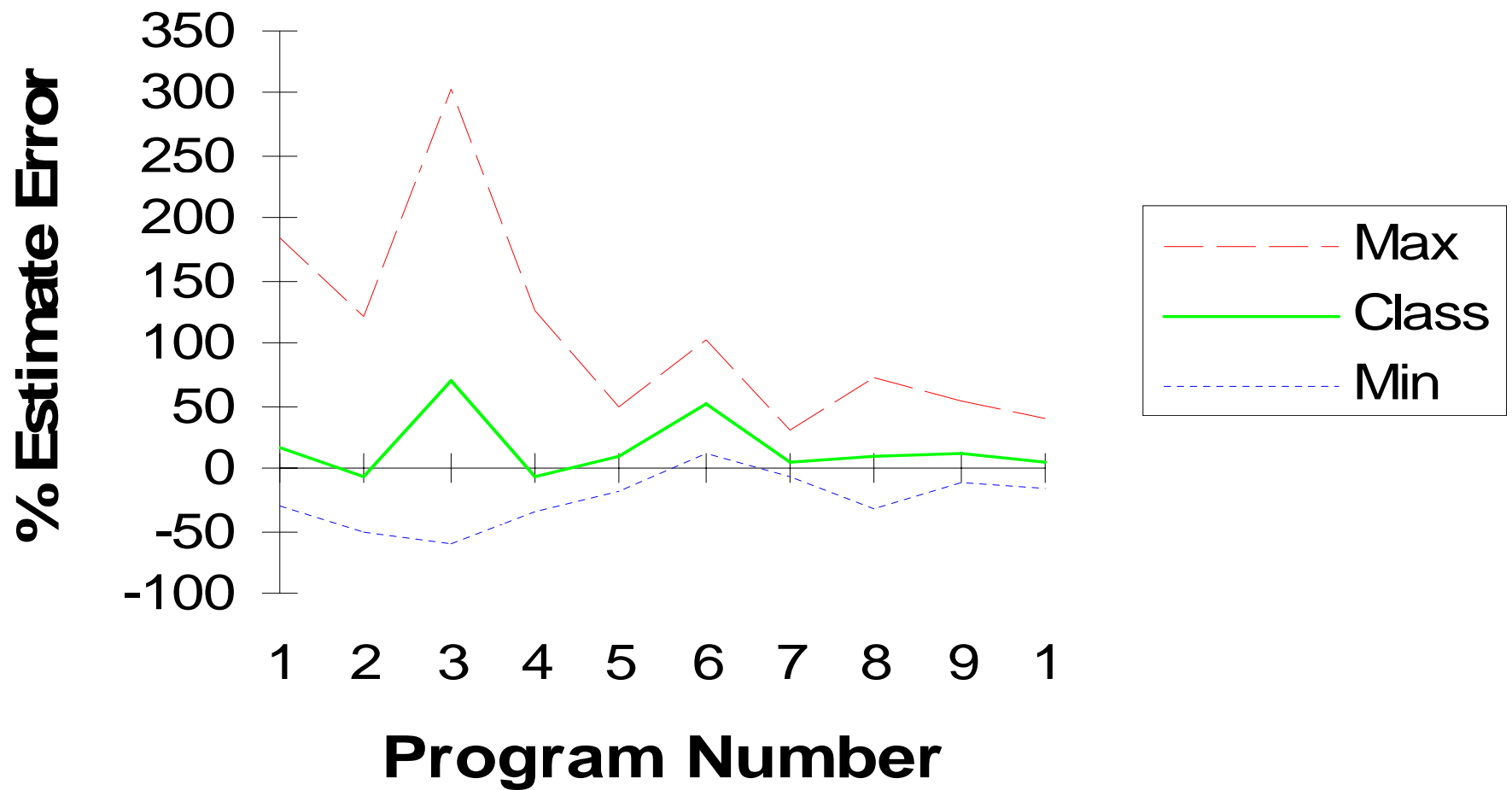
Vic Basili foreword to Watts' book
A discipline for software engineering



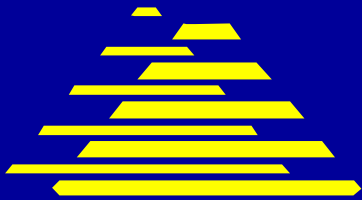
The PSP Process Flow



Time Estimating Accuracy - % Error

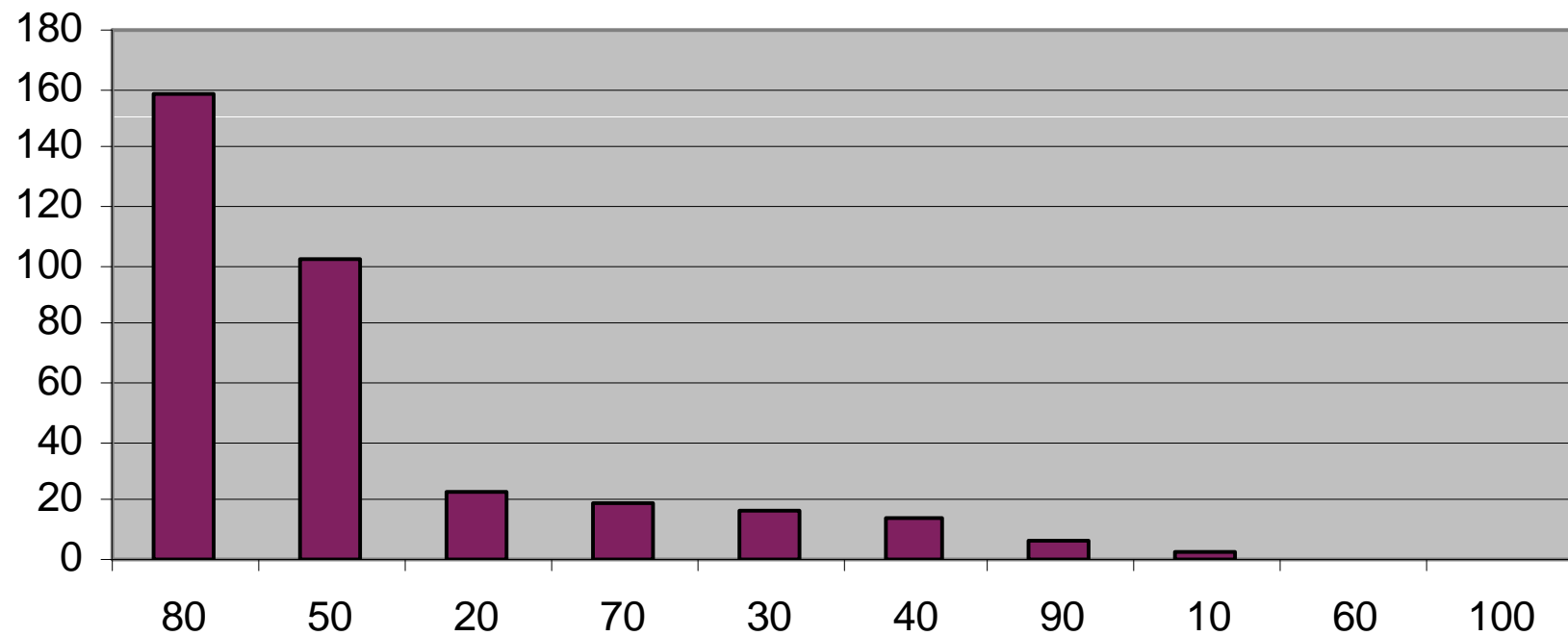




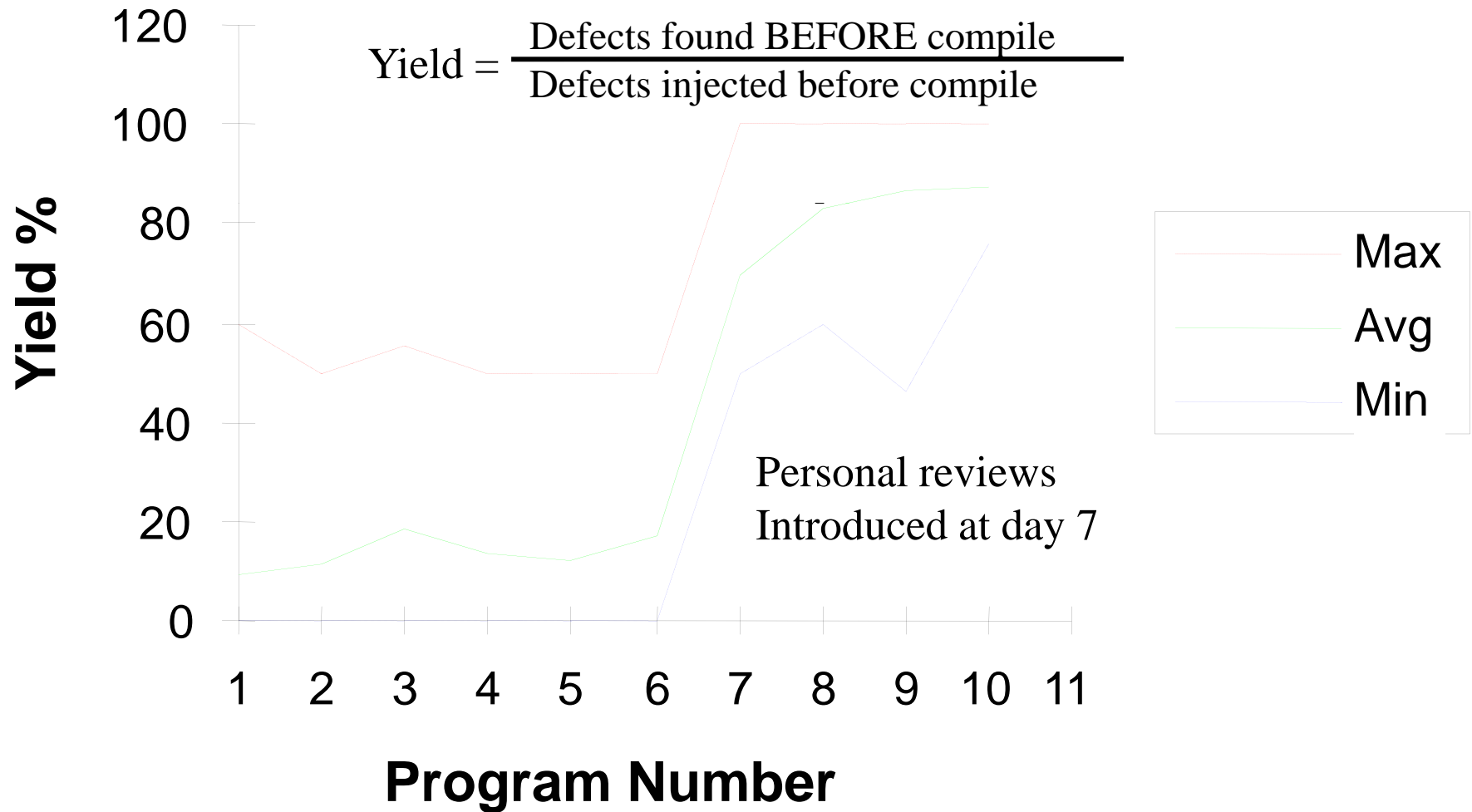


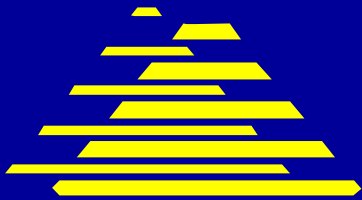
Data driven improvement

Defect Fix Time By Type



Yield - All Students, All Programs





PSP Return On Investment

The following
test (I&S) rework
after PSP training

Example from Microsoft

It took 250 engineers an entire year to remove
30,000 defects from Windows NT 4.0

At 2,000 h per staff year that's 500kh

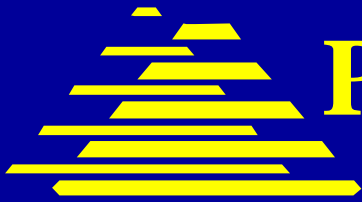
Or $500/30=16.7 \sim 17\text{h}$ per defect

Usual rule of thumb is 10-40h/defect in I/S test

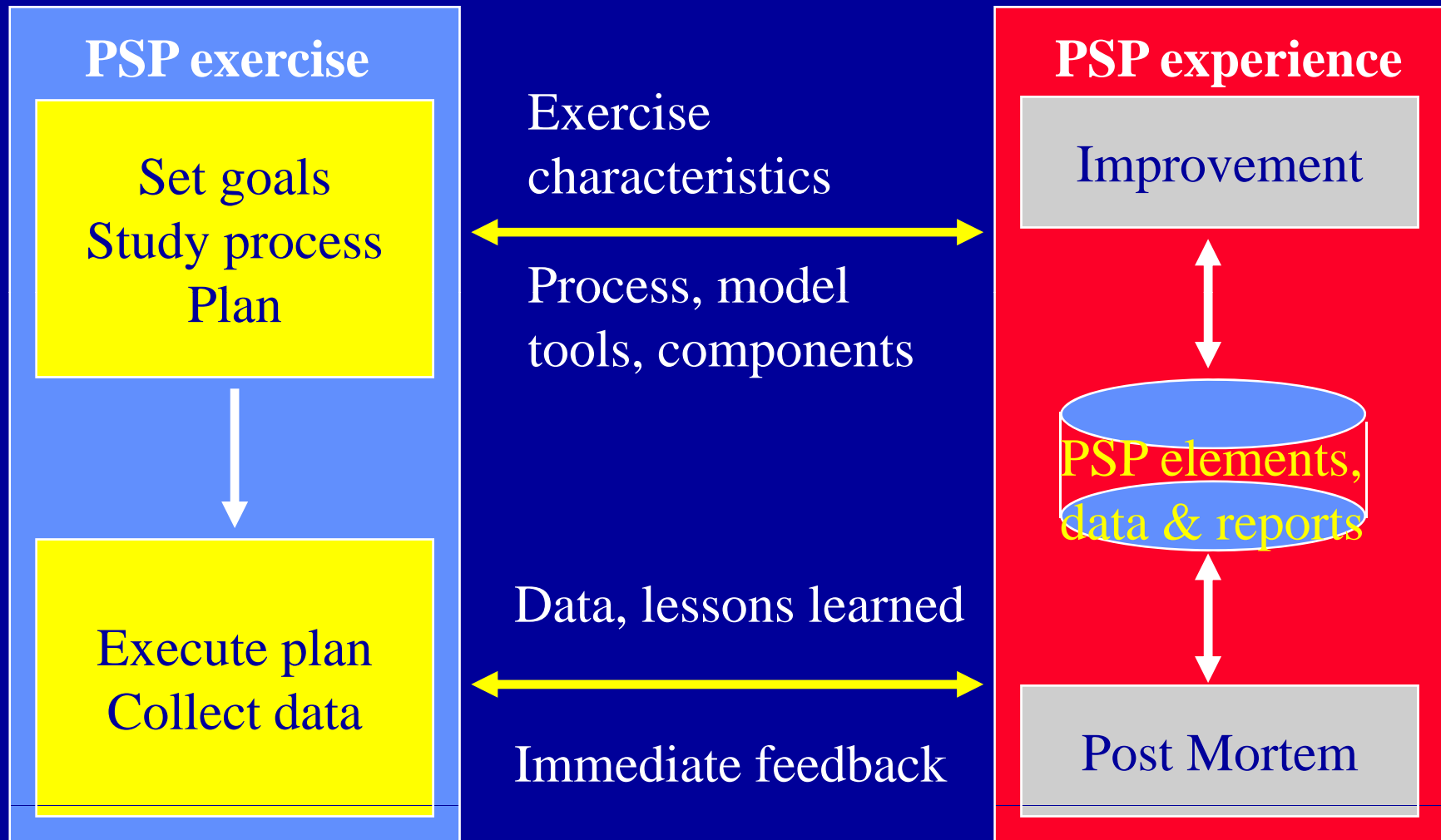
and system
before and

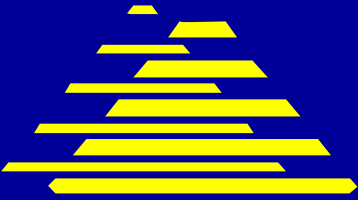
		After PSP
Defects/KLOC into Unit Test	40	10
Yield for Unit Test	50%	50%
Defects/KLOC into I&S Test	20	5
I&S Defect fix time/KLOC	200	50

Integration and system test rework savings are 150 hours per
KLOC (training **costs recovered in less than 6 weeks** of work!)



PSP: An experience workshop?¹⁷





What's a TSP?

18

The Team Software Process uses the PSP principles to

- Apply the PSP sound **engineering discipline** to project work
- Form and help perform **outstanding self directed teams**
- Produce **quality software** on time and within budget
- Proactively manage **project risk** and **change**
- Continuously improve **team processes**
- To produce **high quality software**

CMMI SCAMPI A results since 2002:

maturity level 1 to 2 takes 14 months

maturity level 2 to 3 takes 17 months

maturity level 3 to 4 takes 15.5 months

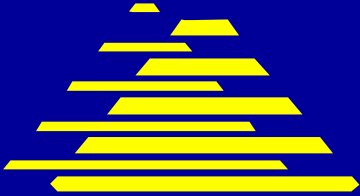
maturity level 4 to 5 takes 12.5 months

PSP/TSP accelerate CMMI maturation by a factor 2..3
(level 1 to 4 in 24 months)¹

The TSP is an agile **level 5 process for small teams**

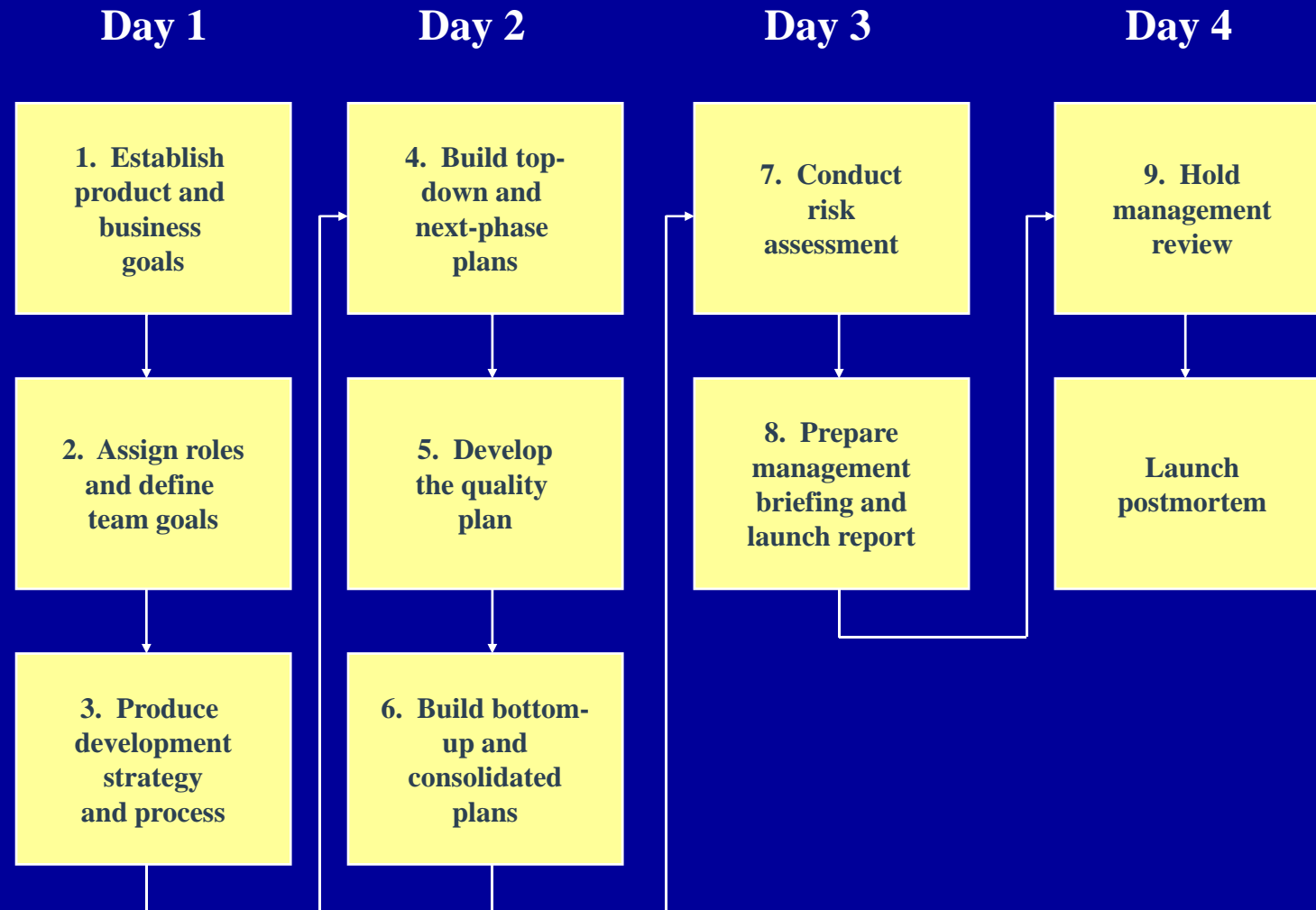
The TSP starts with a project “launch”

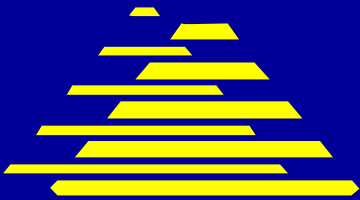
1- Julie Switzer, NAVAIR TSP symposium 2008



What's a launch?

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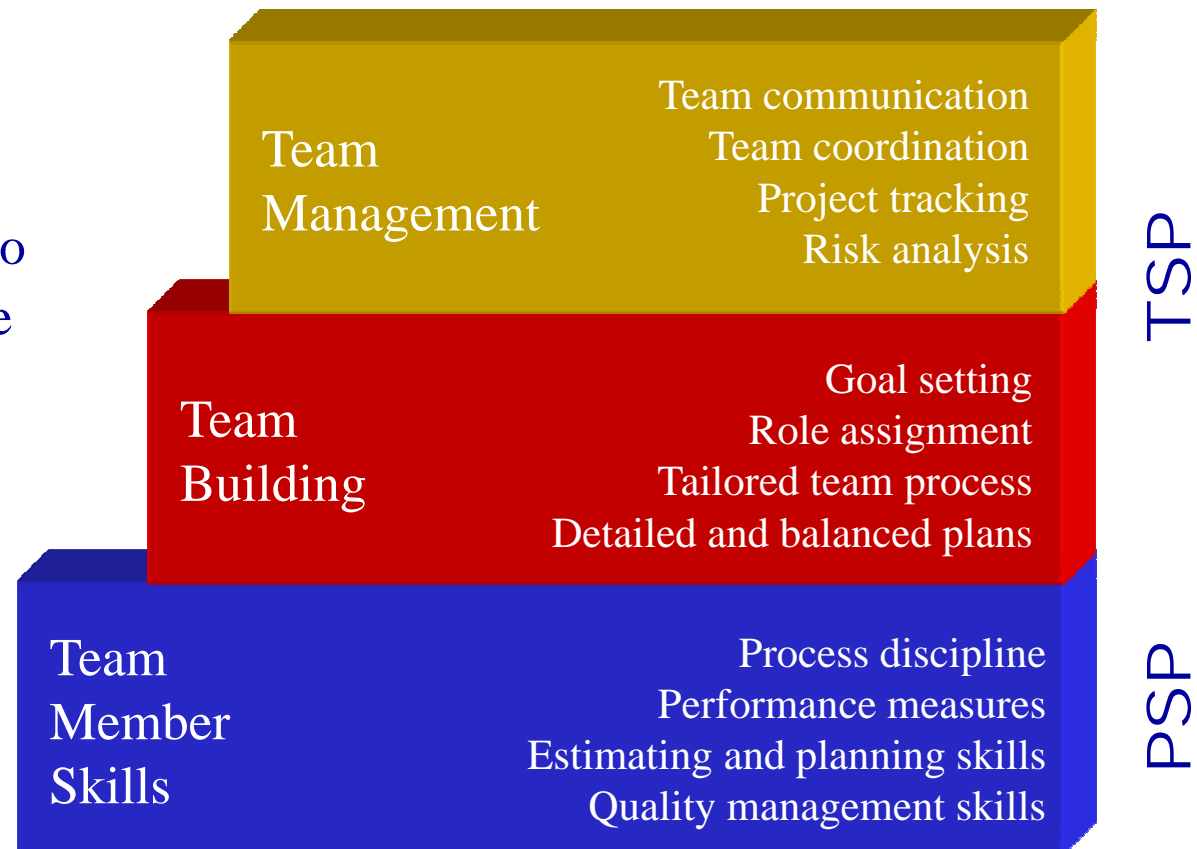


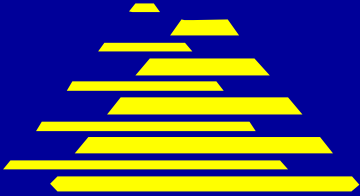


Building High-Performance Teams

The TSP strategy is to improve performance from the bottom up.

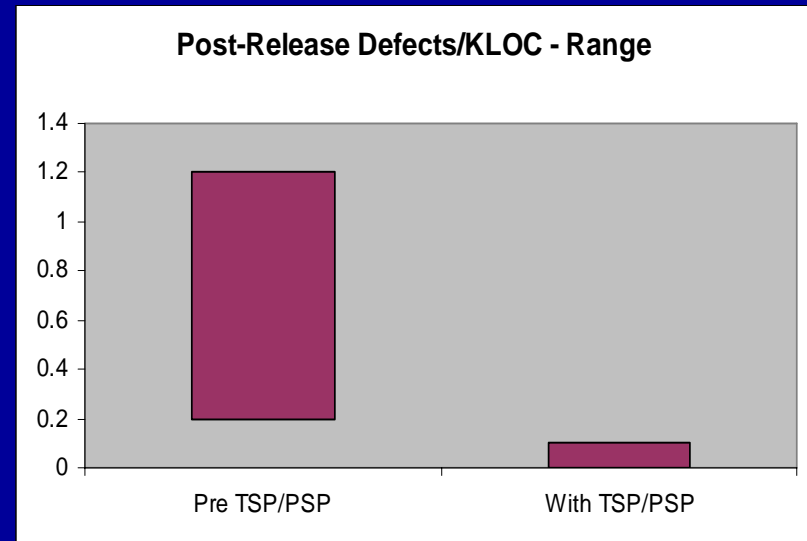
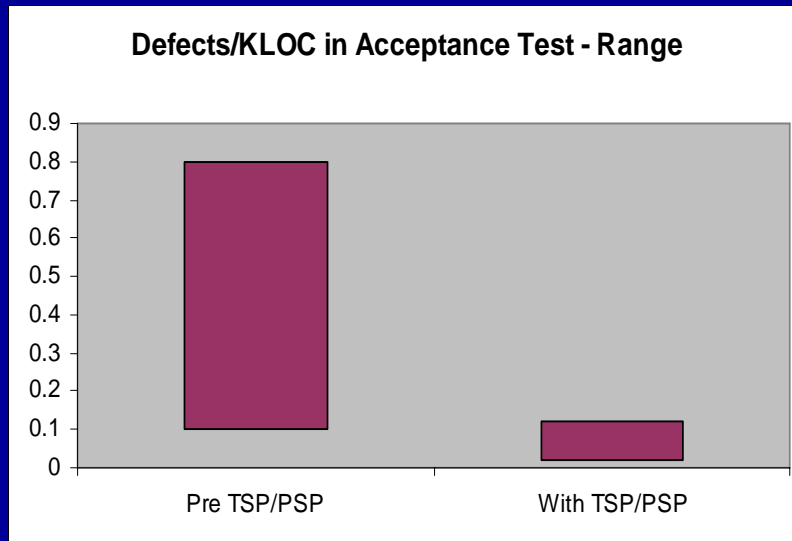
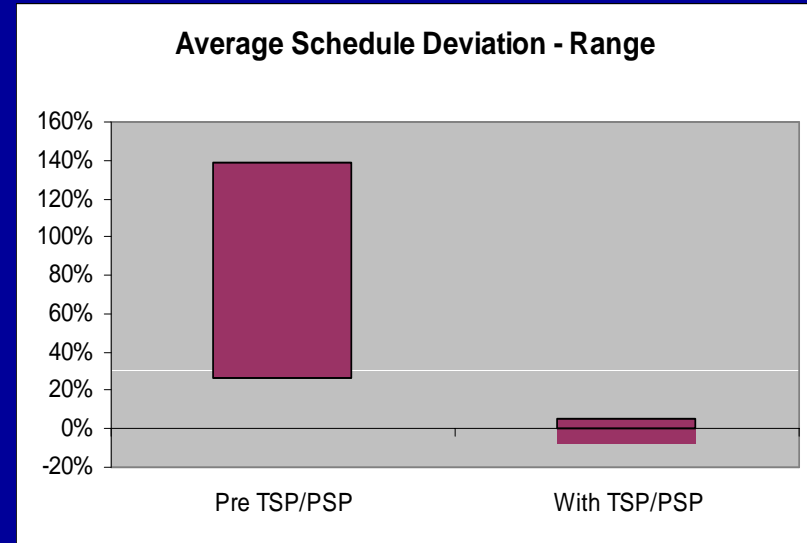
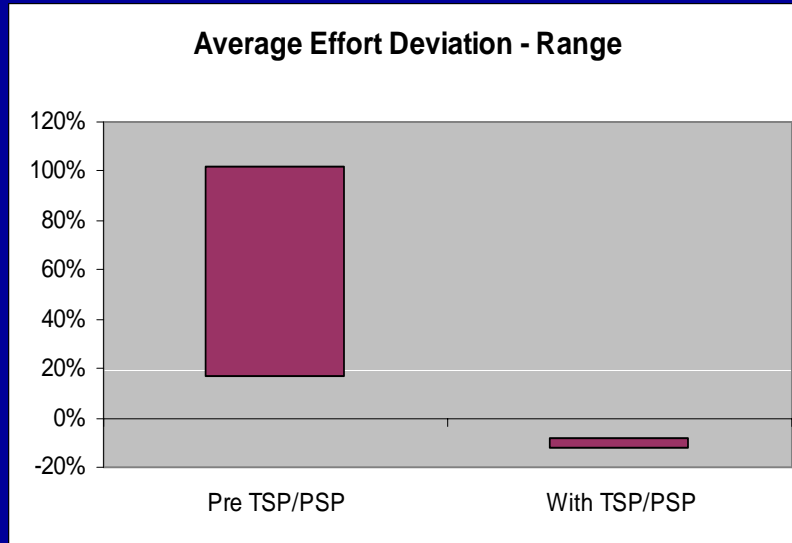
This strategy starts with PSP training.

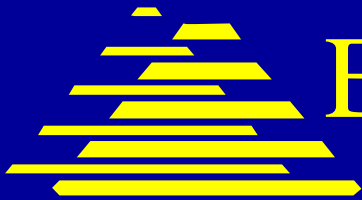




PSP/TSP impact

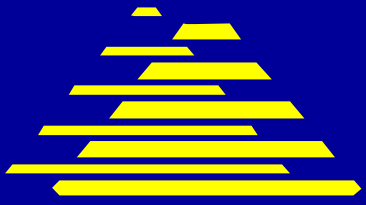
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Earned value for the rest of us ²²

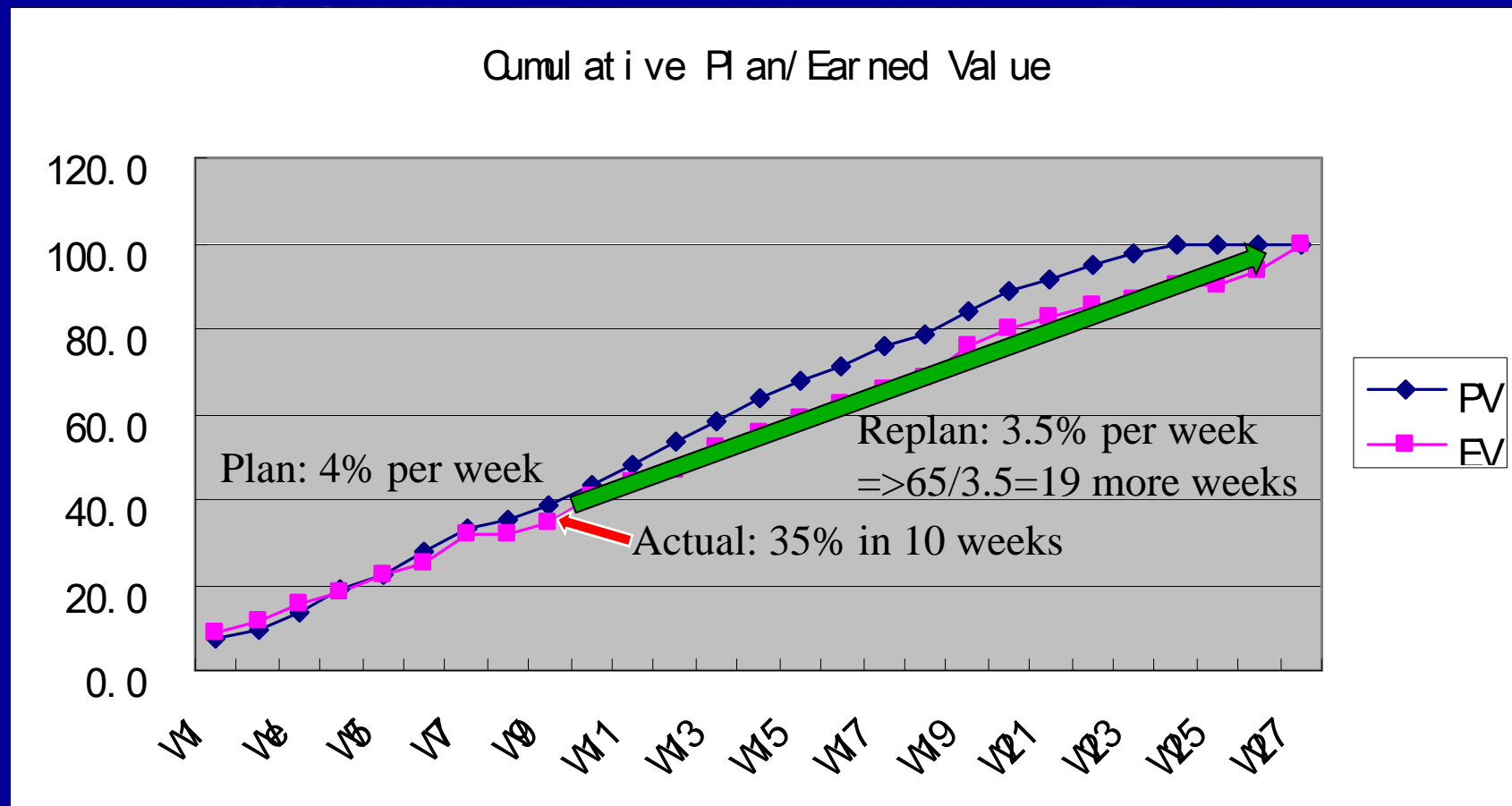
My week	EV	Estim.	Sum	Done by
Prepare presentation	25%	5h	5h	Tuesday
Design a little	15%	3h	8h	Tuesday
Attend useless meeting	7.5%	1.5h	9,5h	Wednesday
Code a little	35%	7h	16.5h	Friday
Test a little	12.5%	2.5h	19h	Friday
Write status report	5%	1h	20h	Friday
		20h		



First PSP/TSP project in PRC

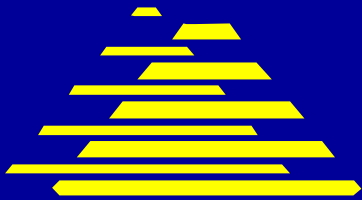
September 2008..March 2009

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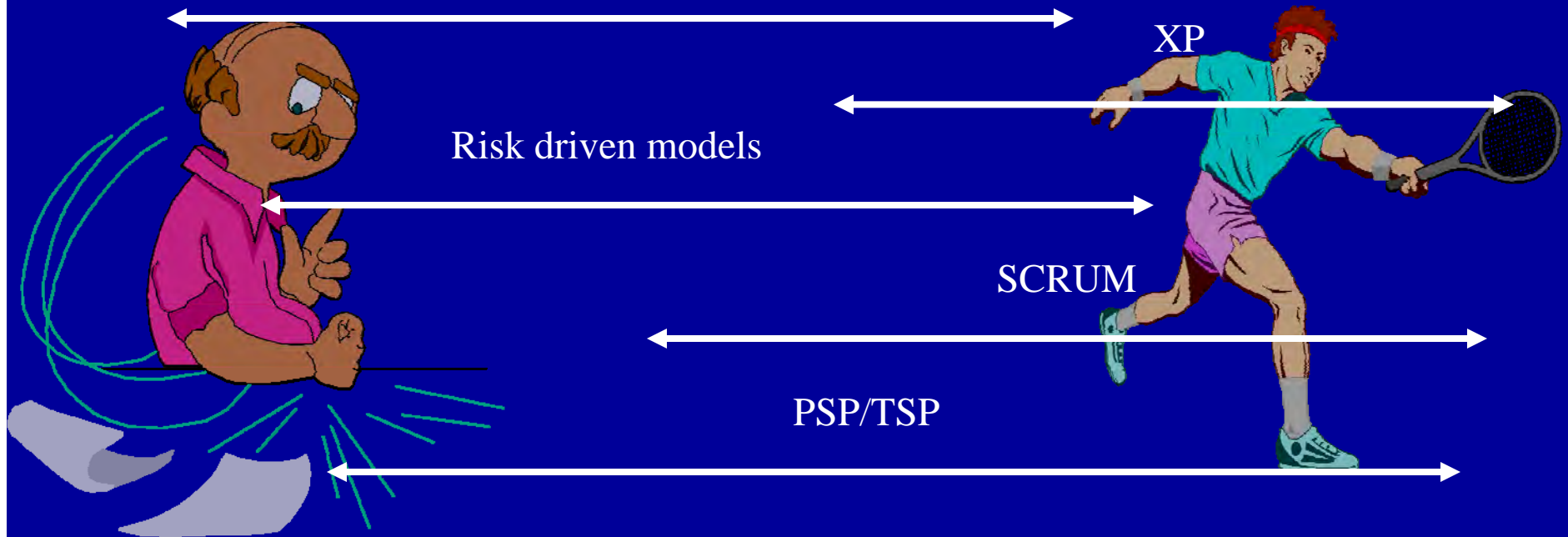
Rigor continuum

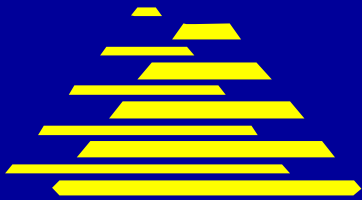
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Ironclad
contract

CMM-I

Sandbox
hacking





Agile CMMI vs. “pure” agile²⁶

Similarities

Self directed teams
Well defined roles
Working sw and biz value
Incremental development
Manager as coach
Quick reaction/incremental
Reviews/inspections
Meaningful meetings
People interaction
Cultural evolution

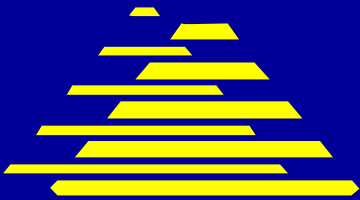
Differences

True blue agile quite a bit more:

- collegial
- code driven
- project centered
- test focused
- time boxed

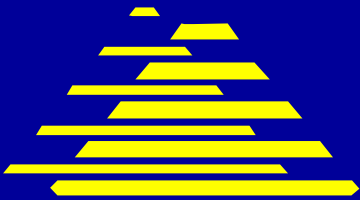
And quite a bit less worried about

- detailed process documentation
- early phases planning/tracking
- product doc. (except code)
- detailed data (but there is some)
- CMM stuff!!!



It's the People stupid!

Levels	People CMM Threads			
	Developing Capability & Competency	Building Workgroups & Culture	Motivating & Managing Performance	Shaping the Workforce
5 Optimizing	Continuous Capability Improvement		Organizational Performance Alignment	Continuous Workforce Innovation
4 Predictable	Mentoring Competency Based Assets	Competency Integration Empowered Workgroups	Quantitative Performance Management	Organizational Capability Management
3 Defined	Competency Development Competency Analysis	Workgroup Development Participatory Culture	Competency Based Practices Career Development	Workforce Planning
2 Managed	Training and Development	Communication & Coordination	Compensation Performance Management Work Environment	Staffing



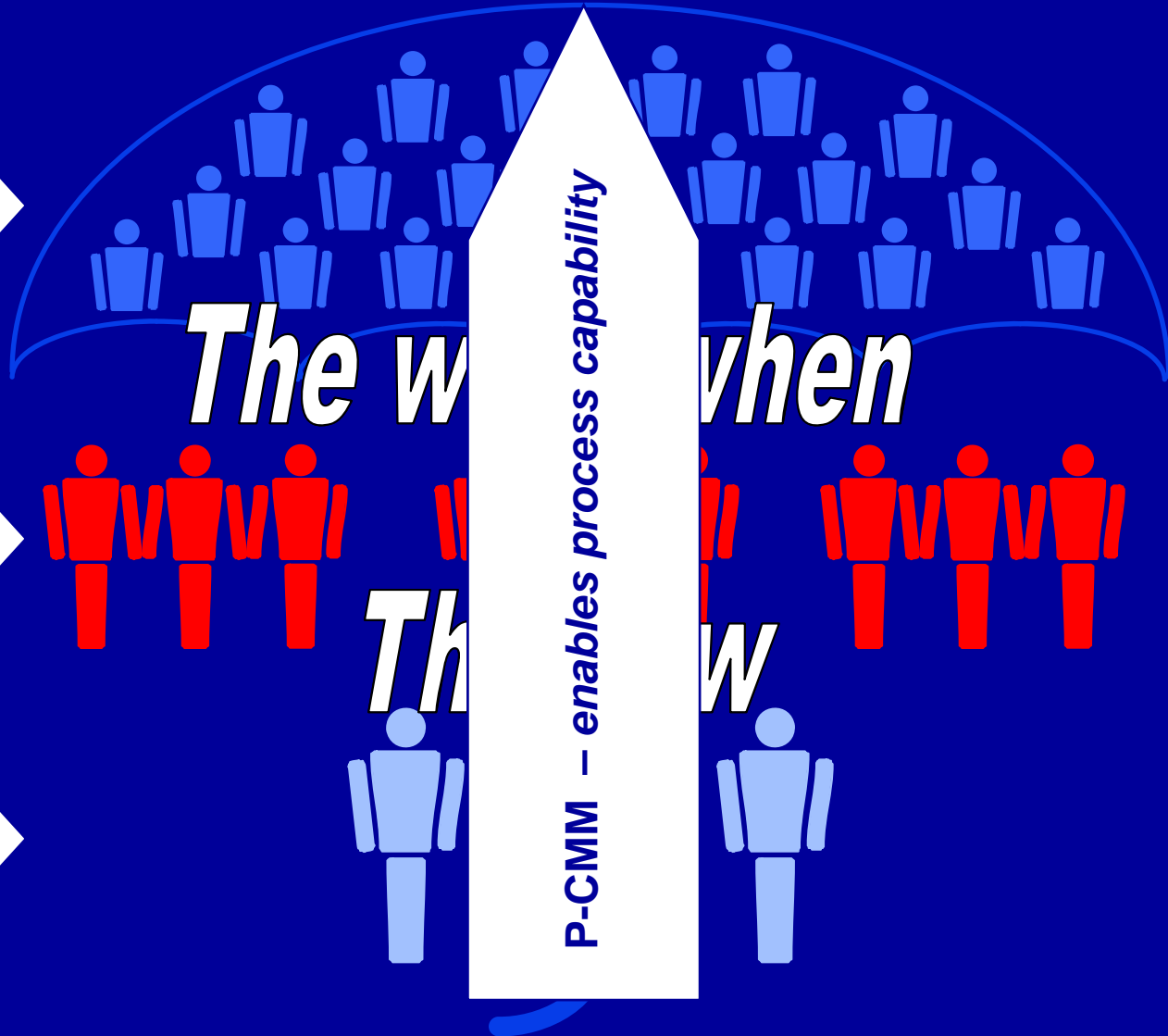
Process synergy: AIM

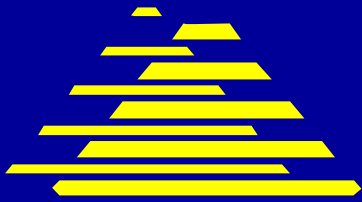
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**CMMI - Builds
organizational
capability**

**TSP - Builds
quality products
on cost and
schedule**

**PSP - Builds
project team
skill & discipline**





AIM: The next wave

India has seen

Indian companies

cost advantage

But rising labor

Competition

– China

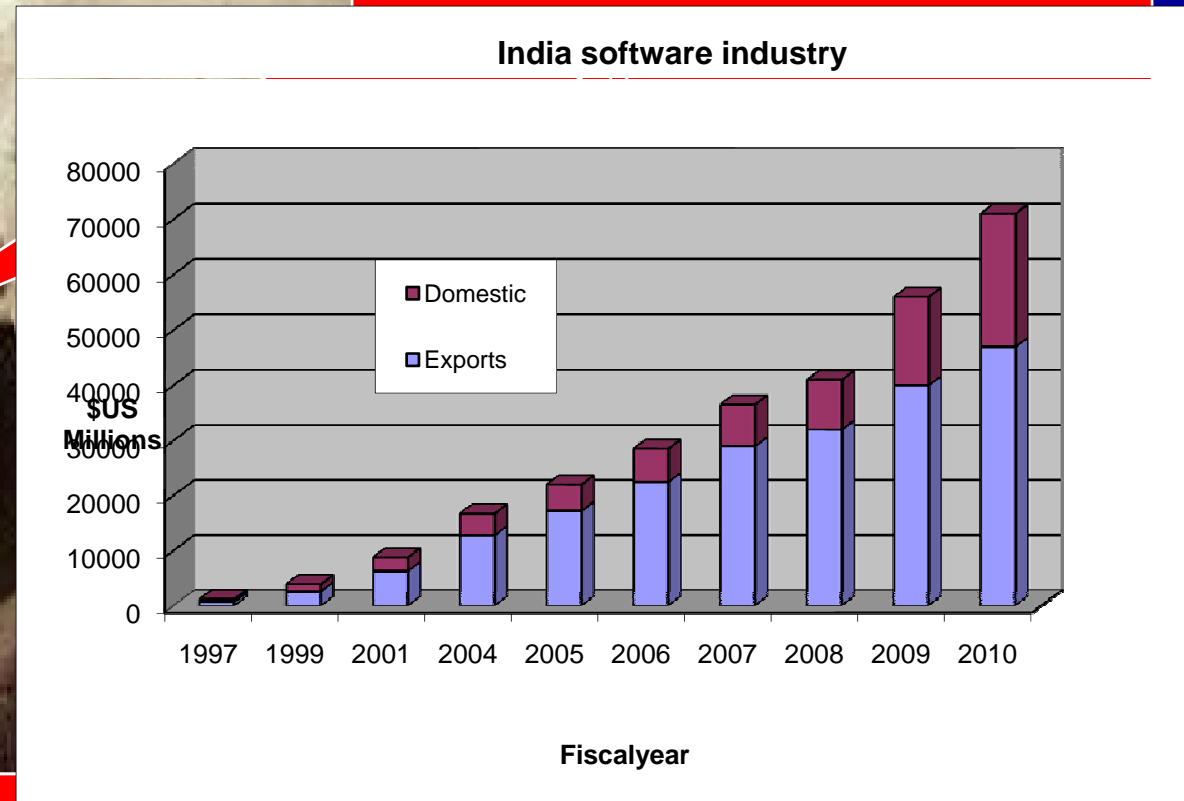
– Ex sov

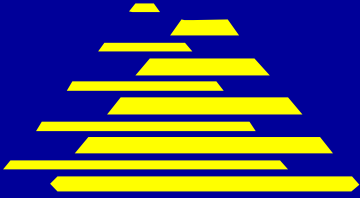
– Latin A

Every company

consistent

In five years, I want
the world to be





Conclusion

Identify, mentor, nurture and lavishly praise local leadership

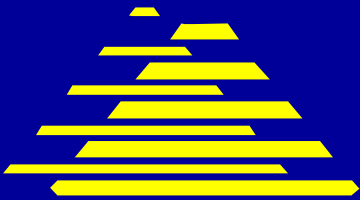
- Get a (preferably knowledgeable) champion
- Work the management chain before and after the TSP-like SPI planning session

Make the culture data hungry one byte at a time

You're not good at planning? Plan often!

Surf the next wave: Go PSP/TSP (it is part of AIM)

Watch failure cost of quality go down, show ROI and celebrate... **But keep going!**



Questions?

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